Space Weather Forecast

Issued on Thursday, 03 February 2022 at 12:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor Geomagnetic Storms at first and again late day 2 into day 3 (4th/5th). Chance of Moderate flares (R1/R2 Radio Blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low with several small common class flares observed. There are currently four sunspot regions spread across the visible disc, with a new region just starting emerge on the northeast limb. No further Earth-directed coronal mass ejections (CMEs) were observed in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind over the past 24 hours was mostly slightly elevated throughout and Earth is experiencing the influence of a Coronal mass Ejection (CME) which left the Sun on 29th January. The magnetic field was weak to moderate for much of the period becoming strong after 03/0430 UTC. The important north-south component remained weak for much of the period becoming moderate to strong after 03/0500 UTC. Geomagnetic activity was Quiet to Active (Kp 1-4), with a rather unexpected minor geomagnetic storm observed 03/0600-0900 UTC.

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low, with a continued chance (30%) of Moderate-class flares and a very slight chance (5%) of a strong flare.

Solar Wind / Geomagnetic Activity: Solar winds will probably remain slightly elevated on day 1 before declining to slow levels by day 2 (4th), as CME influences wane. Solar winds may become elevated later on day 2 (4th), but more likely on day 3 (5th), due to an enhanced solar winds regime affecting Earth for a time. Quiet to Unsettled geomagnetic activity is generally likely for much of the period with a chance of Active intervals into day 3 (5th). Geomagnetic storms are likely at first and there's also a chance (20%) of a G1/Minor Storm interval in association with the arrival of the faster solar winds on days 2 and 3 (4/5th).

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) is forecast to remain at background levels whilst the sunspots we are presented with remain quiet and stable, with no radiation storms currently expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	20	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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